AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
J	1 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0004	30-Aug-2002	W68MD9-2016-0845	

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than item 6)	CODE
USA ENGINEER DISTRICT, SEATTLE ATTN: CENWS-CT P.O. BOX 3755 SEATTLE WA 98124-3755	DACA67	**See Item 6**	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
	X	9A. AMENDMENT OF SOLICITATION NO. DACA67-02-R-0215
	X	9B. DATED (SEE ITEM 11) 17-Jan-2002
		10A. MOD. OF CONTRACT/ORDER NO.
		10B. DATED (SEE ITEM 13)
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [X] is extended, [ ] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Correct drawings and specifications

DACA67-02-R-0215
Upgrade Waste Water Treatment Plant, Fort Lewis, WA

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
	TEL: EMAIL:

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)	30-Aug-2002

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

The following items are applicable to this modification:

CONT. SHEET

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

A. This amendment is issued to provide for revisions to the solicitation as follows:

1. Section 00800 SPECIAL CLAUSES: Drawing Index revisions and drawing revisions by notation
2. Section 01410 Environmental Protection: Revised paragraph 3.9.6
3. Section 02531 Repair Sanitary Sewers (Option Item 0006): Revised paragraph 3.5.3
4. Section 11325 Grit Cross Collectors: Revised paragraphs 2.2, 2.3, 2.4 and 2.8

B. THE PROPOSAL DUE DATE AND TIME HAS BEEN CHANGED TO 3:00 PM (PDT), 6 SEPTEMBER 2002.

C. NOTICE TO OFFERORS: Offerors must acknowledge receipt of this amendment by number and date on Standard Form 1442 BACK, in Block 19, or by telegram.

D. All Technical Amendments are available for download on this date from the Army Corps of Engineers website found at http://www.nws.usace.army.mil/ct/.

Enclosures:
Section 00800 SPECIAL CLAUSES
Section 01410 Environmental Protection
Section 02531 Repair Sanitary Sewers
Section 11325 Grit Cross Collectors

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SPECIAL CLAUSES

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SECTION 00800

SPECIAL CLAUSES

SC-1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984) (FAR 52.211-10).

The Contractor shall be required to (a) commence work under this Contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 540 calendar days after date of receipt by Contractor of notice to proceed. The time stated for completion shall include final cleanup of the premises.

SC-1.1 OPTION FOR INCREASED QUANTITY

a. The Government may increase the quantity of work awarded by exercising Optional Item 0005 or 0006 at any time, or not at all, but no later than 90 calendar days after receipt by Contractor of notice to proceed. Notice to proceed on work Item added by exercise of the option will be given upon execution of consent of surety.

b. The parties hereto further agree that any option herein shall be considered to have been exercised at the time the Government deposits written notification to the Contractor in the mails.

c. The time allowed for completion of any optional items awarded under this contract will be the same as that for the base item, and will be measured from the date of receipt of the notice to proceed for the base item.

SC-1.2 Exception to Completion Period(s): In case the Contracting Officer determines that completion of seeding, sodding, and planting, and establishment of same is not feasible within the completion period stated above, the Contractor shall accomplish such work in the first planting period following the contract completion period and shall complete such work as specified, unless other planting periods are directed or approved by the Contracting Officer.

SC-2. LIQUIDATED DAMAGES - CONSTRUCTION (SEP 2000) (FAR 52.211-12)

(a) If the Contractor fails to complete the work within the time specified in the Contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of $846.00 for each day of delay.

(b) If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

(c) If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

(d) Exception to Liquidated Damage: In case the Contracting Officer determines that completion of work stated above in paragraph Exception to Completion Period(s) is not feasible during the completion period(s) stated in SC-1, such work will be exempted from liquidated damages.

SC-3. TIME EXTENSIONS (SEP 2000) (FAR 52.211-13): Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the Contract completion date will be extended only for those specific elements related to the changed work and that the remaining Contract completion dates for all other portions of the work will not be altered. The change order also may provide for an equitable readjustment of liquidated damages under the new completion schedule.

SC-4. DELETED

SC-5. INSURANCE - WORK ON A GOVERNMENT INSTALLATION (JAN 1997) (FAR 52.228-5)

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance period of this Contract at least the kinds and minimum amounts of insurance required in the Insurance Liability Schedule or elsewhere in the Contract.

(b) Before commencing work under this Contract, the Contractor shall certify to the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective:

(1) for such period as the laws of the State in which this Contract is to be performed prescribe; or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this Contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the Contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

(d) Insurance Liability Schedule (FAR 28.307-2)

(1) Workers' compensation and employer's liability. Contractors are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when Contract operations are so commingled with a Contractor's commercial operation that it would not be practical to require

this coverage. Employer's liability coverage of at least $100,000 shall be required, except in states with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers.

(2) General Liability.

(a) The Contracting Officer shall require bodily injury liability insurance coverage written on the comprehensive form of policy of at least $500,000 per occurrence.

(b) Property damage liability insurance shall be required only in special circumstances as determined by the agency.

(3) Automobile liability. The Contracting Officer shall require automobile liability insurance written on the comprehensive form of policy. The policy shall provide for bodily injury and property damage liability covering the operation of all automobiles used in connection with performing the Contract. Policies covering automobiles operated in the United States shall provide coverage of at least $200,000 per person and $500,000 per occurrence for bodily injury and $20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

(4) Aircraft public and passenger liability. When aircraft are used in connection with performing the Contract, the Contracting Officer shall require aircraft public and passenger liability insurance. Coverage shall be at least $200,000 per person and $500,000 per occurrence for bodily injury, other than passenger liability, and $200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least $200,000 multiplied by the number of seats or passengers, whichever is greater.

SC-6. DELETED

SC-7. PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984) (FAR 52.236-1): The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty percent (15%) of the total amount of work to be performed under the Contract. The percentage may be reduced by a supplemental agreement to this Contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

SC-8. PHYSICAL DATA (APR 1984) (FAR 52.236-4): Data and information furnished or referred to below is for the Contractor's information. The Government will not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

(a) Physical Conditions: Not used.

(b) Weather Conditions: Each bidder shall be satisfied before submitting his bid as to the hazards likely to arise from weather conditions. Complete weather records and reports may be obtained from any National Weather Service Office.

(c) Transportation Facilities: Each bidder, before submitting his bid, shall make an investigation of the conditions of existing public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress at the jobsite. The unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of the work.

(d) Right-of-Way: Not used.

(e) Condition of Area: The condition of the area when last surveyed is shown on the drawings. Topography is in feet and represents elevation with reference to mean lower low water (M.L.L.W.).

(f) Obstruction of Channel: Not used.

(g) Datum and Bench Marks: The plane of reference shown on the drawings.

SC-9. DELETED

SC-10. LAYOUT OF WORK (APR 1984) (FAR 52.236-17): The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due, or to become due, to the Contractor.

SC-11 THROUGH SC-13. DELETED

SC-14. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAY 1999)- (EFARS 52.231-5000)

(a) This clause does not apply to terminations. See 52.249-5000, Basis for Settlement of Proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense

Schedule, Region VIII. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

(e) Copies of EP1110-1-8 “Construction Equipment Ownership and Operating Expense Schedule” Volumes 1 through 12 are available in Portable Document Format (PDF) and can be viewed or downloaded at http://www.usace.army.mil/inet/usace-docs/eng-pamplets/cecw.htm. A CD-ROM containing (Volumes 1-12) is available through either the Superintendent of Documents or Government bookstores. For additional information telephone 202-512-2250, or access on the Internet at http://www.access.gpo.gov/su_docs.

SC-15. PAYMENT FOR MATERIALS DELIVERED OFF-SITE (MAY 1999)-(EFARS 52.232-5000)

(a) Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

(b) Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. In addition to petroleum products, payment for materials delivered off-site is limited to the following items: Any other construction material stored offsite may be considered in determining the amount of a progress payment.

SC-16 AND SC-17. DELETED

SC-18. CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)(DOD FAR SUPP 252.236-7001)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors which might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general—

(1) Large scale drawings shall govern small scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified in the index of drawings attached at the end of the Special Clauses.

SC-23. RECOVERED MATERIALS: The Corps of Engineers encourages all bidders to utilize recovered materials to the maximum extent practicable. The attached APPENDIX R contains procurement guidelines for products containing recovered materials.

APPENDIX R

PART 247 - COMPREHENSIVE PROCUREMENT GUIDELINE FOR PRODUCTS CONTAINING RECOVERED MATERIALS

40 CFR Ch. 1 (9-1-99 Edition)

Subpart B-Item Designations

§ 247.10 Paper and paper products.

Paper and paper products, excluding building and construction paper grades.

§ 247.11 Vehicular products.

(a) Lubricating oils containing re-refined oil, including engine lubricating oils, hydraulic fluids, and gear oils, excluding marine and aviation oils.
(b) Tires, excluding airplane tire
(e) Reclaimed engine coolants, excluding coolants used in non-vehicular applications.

247.12 Construction products.

(a) Building insulation product including the following items:
  (1) Loose-fill insulation, including but not limited to cellulose fiber, mineral fibers (fiberglass and rock vermiculite, and perlite;
  (2) Blanket and batt insulation, including but not limited to mineral fibers (fiberglass and rock wool).
  (3) Board (sheathing, roof decking wall panel) insulation, including but not limited to structural fiberboard and laminated paperboard products perlite composite board, polyurethane, polyisocyanurate, polystyrene, phenolics, and composites; and
  (4) Spray-in-place insulation, including but not limited to foam-in-place polyurethane and polyisocyanurate and spray-on cellulose.
(b) Structural fiberboard and laminated paperboard products for applications other than building insulation, including building board, sheathing shingle backer, sound deadening board, roof insulating board, insulating wallboard, acoustical and non-acoustical ceiling tile, acoustical and non-acoustical lay-in panels, floor underlayments, and roof overlay (cover board).
(c) Cement and concrete, including concrete products such as pipe and block, containing coal fly as ground granulated blast furnace (GGBF) slag.
(d) Carpet made of polyester fiber use in low- and medium-wear applications.
(e) Floor tiles and patio block containing recovered rubber or plastic.
(f) Shower and restroom dividers/partitions containing recovered plastic or steel.
(1) Consolidated latex paint used for covering graffiti; and (2) Reprocessed latex paint used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood and metal surfaces.

§247.13 Transportation products.

(a) Traffic barricades and traffic cones used in controlling or restricting vehicular traffic.
(b) Parking stops made from concrete or containing recovered plastic or rubber.
(c) Channelizers containing recovered plastic or rubber.
(d) Delineators containing recovered plastic, rubber, or steel.
(e) Flexible delineators containing recovered plastic.

§ 247.14 Park and recreation products

(a) Playground surfaces and running tracks containing recovered rubber or plastic.
(b) Plastic fencing containing recovered plastic for use in controlling snow or sand drifting and as a warning/safety barrier in construction or other applications.

247.15 Landscaping products.

(a) Hydraulic mulch products containing recovered paper or recovered wood used for hydroseeding and as an over-spray for straw mulch in landscaping, erosion control, and soil reclamation.
(b) Compost made from yard trimmings, leaves, and/or grass clippings for use in landscaping, seeding of grass or other plants on roadsides and embankments, as a nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.
(c) Garden and soaker hoses containing recovered plastic or rubber.
(d) Lawn and garden edging containing recovered plastic or rubber.

§ 247.16 Non-paper office product.

(a) Office recycling containers and office waste receptacles.
(b) Plastic desktop accessories.
(c) Toner cartridges.
(d) Binders.
(e) Plastic trash bags.
(f) Printer ribbons.
(g) Plastic envelopes.

§ 247.17 Miscellaneous products.

Pallets containing recovered wood, plastic, or paperboard.

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Fort Lewis, Washington
Project Number IJO DEP 17-1J, RPL Digesters;
IJO DEP 18-1J, RR Lift Station
File No. 22s/831-13-01

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94	M9-3	Digester Control Room No. 1 Sections and Expansion Tank Schematic		25-Jan-02
95	M10-1	Propane Storage Facility Plan, Section and Details		25-Jan-02
96	M11-1	Trickling Filter Modifications Plan, Elevation and Details		25-Jan-02
97	E-1	Existing/Demolition Site Plan		25-Jan-02
98	E-2	Revised Site Plan		25-Jan-02
99	E-3	Electrical Plans - Existing and Revised Transformer/Switchboard Area		25-Jan-02
100	E-4	Electrical Details and Symbol Schedules		25-Jan-02
101	E-5	Electrical Details and Lighting Fixture Schedule		25-Jan-02
102	E-6	Existing/Initial Demolition One Line Diagram - Power Distribution System		25-Jan-02
103	E-7	Existing/Intermediate Demolition One Line Diagram - Power Distribution System		25-Jan-02
104	E-8	Final Revised One Line Diagram - Electrical Power Distribution System		25-Jan-02
105	E-9	Existing Panelboard Circuit Schedules		25-Jan-02
106	E-10	New/Revised Panelboard Circuit Schedules		25-Jan-02
107	E-11	Elevations and Schedules Motor Control Centers 1, 4 and 4A		25-Jan-02
108	E-12	One Line Diagram Existing Motor Control Center “MCC 1”		25-Jan-02
109	E-13	One Line Diagram Existing Motor Control Center “MCC 4”		25-Jan-02

Sheet Number	Plate Number	Title	Revision Number	Date
110	E-14	One Line Diagrams New Motor Control Center “MCC 1”		25-Jan-02
111	E-15	One Line Diagram Revised Motor Control Center “MCC 4”		25-Jan-02
112	E-16	One Line Diagram New Motor Control Center “MCC 4A”		25-Jan-02
113	E-17	Elementary Wiring Diagrams Existing Motor Control Center “MCC 1”		25-Jan-02
114	E-18	Elementary Wiring Diagrams Existing Motor Control Center “MCC 4”		25-Jan-02
115	E-19	Elementary Wiring Diagrams New Motor Control Center “MCC 1”		25-Jan-02
116	E-20	Elementary Wiring Diagrams - New/Revised Motor Control Centers “MCC4” & “MCC 4A”		25-Jan-02
117	E-21	Elevations Existing Plant Operations Panel		25-Jan-02
118	E-22	Elevations Intermediate Plant Operations Panel		25-Jan-02
119	E-23	Elevations Revised Plant Operations Panel		25-Jan-02
120	E-24	Terminal Block Diagrams - Existing Plant Operations Panel		25-Jan-02
121	E-25	Elementary Wiring Diagrams – Existing Plant Operations Panel		25-Jan-02
122	E-26	Elementary Wiring Diagrams Existing Plant Operations Panel		25-Jan-02
123	E-27	Elementary Wiring Diagrams Existing Plant Operations Panel		25-Jan-02
124	E-28	Elementary Wiring Diagrams Revised Plant Operations Panel		25-Jan-02
125	E-29	Elementary Wiring Diagrams Revised Plant Operations Panel		25-Jan-02
126	E-30	Elementary Wiring Diagrams Revised Plant Operations Panel		25-Jan-02
127	E-31	Analog Loop Diagrams Plant Operations Panel		25-Jan-02
128	E-32	Communications Block Diagram		25-Jan-02
129	E1-1	Demolition Plan Headworks		25-Jan-02

Sheet Number	Plate Number	Title	Revision Number	Date
130	E1-2	Power and Lighting Plan Headworks - Upper Structure		25-Jan-02
131	E1-3	Electrical Plans - Headworks - Lower Structure		25-Jan-02
132	E1-4	Electrical Plans - Headworks Area		25-Jan-02
133	E2-1	Power and Instrumentation Plan - Existing Primary Clarifiers/Chorine Contact Tanks		25-Jan-02
134	E5-1	Existing/Demolition and Revised Electrical Plans - Gravity Thickener		25-Jan-02
135	E6-1	Existing/Demolition and Revised Electrical Plans Thickened Sludge Pump Room		25-Jan-02
136	E8-1	Existing/Demolition Electrical Plans Digester Control Room No. 2		25-Jan-02
137	E8-2	Existing/Demolition Electrical Plans Anaerobic Digesters		25-Jan-02
138	E8-3	Revised Electrical Plans Digester Control Room No. 2		25-Jan-02
139	E8-4	Revised Electrical Plans Anaerobic Digesters		25-Jan-02
140	E9-1	Demolition Lighting Plan Administration Building		25-Jan-02
141	E9-2	Demolition Power Plan Administration Building		25-Jan-02
142	E9-3	Intermediate Power Plan Administration Building		25-Jan-02
143	E9-4	Revised Lighting Plan Administration Building		25-Jan-02
144	E9-5	Revised Power Plan Administration Building		25-Jan-02
145	E9-6	Mechanical Power Plan Administration Building		25-Jan-02
146	E9-7	Process Power and Instrumentation Plan - Administration Building		25-Jan-02
147	E9-8	Communications Plan Administration Building		25-Jan-02
148	E9-9	Existing/Demolition and Revised Electrical Plans - Existing Shop Building		25-Jan-02
149	E12-1	Power and Lighting Plan Temporary Administrative Facilities		25-Jan-02
149a	C-1	Repair Sanitary Sewers, Plan & Profile (Option Item ~~0003~~0006)		5-Jul-02

Sheet Number	Plate Number	Title	Revision Number	Date
149b	C-2	Repair Sanitary Sewers, Plan & Profile (Option Item ~~0003~~0006)		5-Jul-02
149c	C-3	Repair Sanitary Sewers, Plan & Profile (Option Item ~~0003~~0006)		5-Jul-02
149d	C-4	Sanitary Sewer Detail (Option Item ~~0003~~0006)		5-Jul-02

DRAWING REVISIONS BY NOTATION

Sheet 1, Plate G-1, Area Map: Change Option Item 0002 to 0005. Change Option Item 0003 to 0006.

Sheet 2, Plate G-2, Drawing Index - Civil Drawings: Sheets 149a, 149b, 149c, 149b, Change Option Item #0003 to #0006.

Sheet 11, Plate G-11: Delete callout located in the center and at the bottom of the sheet which reads, “Backflow Preventer and Hotbox See M2-2”.

Sheet 29, Plate S-6:

a. Section J/S-4 - Change height callout on left side of the section from “VARIES (“H” MAX. =18’-6”) to “VARIES (“H” MAX. = 19’-1 ½”)”.

b. Section H/S-4 – Change height callout on left side of section from “VARIES (“H” MAX.=10’-0”) to “VARIES (“H” MAX.=11’-1 ½”)”.

Sheet 42, Plate S8-2, CMU WALLS PLAN: Add “3’-0”x7’-0” HM Door” callout to the door opening.

Sheet 45, Plate S8-5: Change Section reference from “J/S8-2” to “J/M8-2”.

Sheet 46, Plate S9-1, Foundation Plan: Change the footing callout at the southeast corner of the Foundation Plan from “FTG 16”X18” DP” TO “FTG 16”x8” DP”.

Sheet 54, Plate P9-2: Revise drawing – The two ½”W lines that are shown connecting to the 1”PRO line shall be changed to be shown connecting to the ¾”W that runs along the south side of the Administration Building.

Sheet 58, Plate H9-1, Chlor. Rm: Change note which reads, “Two existing wall mounted … holes with CMU” to “Two existing wall mounted exhaust fans to remain.”

Sheet 61, Plate M-1: Add “BWS” and “BWR” to the first cell in the left hand column of the Piping Material and Jointing Schedule:

Sheet 71, Plate M2-1: Add the following to Note 2. “At the Contractor's discretion, only the existing chains and flights may be removed and reinstalled to facilitate liner application. No

equipment that is permanently affixed to the clarifier floors or walls may be removed. Any damaged equipment will be replaced by the Contractor at no additional cost to the owner."

Sheet 84, Plate M7-3, Sections A/M7-2 and B/M7-2: Change Detail callout “11/M-4” to “1/M-4” (2 places)

Sheet 90, Plate M8-6, Section B/-: Delete callout “SECOND STAGE PRESSURE REGULATOR (10 PSI TO 1 PSI)”.

Sheet 143, Plate E9-4: Change “C2” fixtures located in the Admin Building Motor Control Center Room to “C”.

Sheet 149a, Drawing Title: Change Option Item #0003 to #0006.

Sheet 149b, Drawing Title: Change Option Item #0003 to #0006.

Sheet 149c, Drawing Title: Change Option Item #0003 to #0006.

Sheet 149d, Drawing Title: Change Option Item #0003 to #0006.

STANDARD DETAILS BOUND IN THE SPECIFICATIONS

Drawing Number	Sheet Number	Title	Date
SECTION 01501 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS			
	1	Hard Hat Sign	10SEP90
	1&2	U.S. Army Project Sign	84JUN20
SECTION 02570 – VALVE VAULTS, CATCH BASINS AND MANHOLES			
	7	WSDOT Catch Basin Type 1, Standard Plan B-1	1997
SECTION 02770 – CONCRETE SIDEWALKS AND CURBS			
	13	WSDOT Cement Concrete Curbs and Gutters, Standard Plan F-1	1997

END OF SECTION

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SECTION 01410

ENVIRONMENTAL PROTECTION

1 GENERAL REQUIREMENTS

1.1 The contractor shall perform the work minimizing environmental pollution and damage as the result of construction operations under this contract. For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the utility of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual esthetics, noise, solid waste, and erosion from stormwater, as well as pollutants.

1.2 ABBREVIATIONS AND ACRONYMS

BACT	Best Available Control Technology
BMP	Best Management Practice
CFR	Code of Federal Regulations
CO	Contracting Officer
COR	Contracting Officer's Representative
DOT	Department of Transportation
ECMD	Engineering & Contract Management Division
ECO	Environmental Compliance Officer
ENRD	Environmental and Natural Resources Division
EPA	Environmental Protection Agency
HM	Hazardous Material
HMTA	Hazardous Materials Transportation Act
HW	Hazardous Waste
HWT	Hazardous Waste Technician

HWMS	Hazardous Waste Management Section
ISCP	Installation Spill Contingency Plan
MSDS	Material Safety Data Sheets
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NOI	Notice of Intent
OSHA	Occupational Safety and Health Act
PCS	Petroleum Contaminated Soil
PPE	Personnel Protective Equipment
PW	Public Works
PSCA	Puget Sound Clean Air Agency
RUL	Restricted Use List
SPCCP	Spill Prevention, Control and Countermeasures Plan
TPCHD	Tacoma Pierce County Health Department
WAC	Washington Administrative Code
WHPA	Well Head Protection Area
WISHA	Washington Industrial Safety and Health Act

1.3 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications.

1.4 SUBCONTRACTORS

The contractor shall ensure compliance with this section by all subcontractors.

1.5 LAWS AND REGULATIONS

The Contractor shall comply with all applicable Federal, State, and Local environmental, natural and cultural resources, and historic preservation laws and regulations. Specific attention is directed to Fort Lewis Regulation No. 200-1 "Environmental Protection and Enhancement". These specifications supplement these laws and regulations.

1.6 COORDINATION

The Environmental and Natural Resources Division (ENRD) of PW coordinates most environmental concerns at Fort Lewis and its sub-installations. Division, Roads and Sanitation Branch of PW Coordination of solid waste, drinking water, and stormwater matters shall be done with production. The Contractor shall make contact with them through PW, Engineering & Contract Management Division.

1.7 SUBMITTALS

Government approval is required for all submittals with a “GA” designation; submittals having an “FIO” designation are for information only. The following shall be submitted in accordance with section 01330 SUBMITTAL PROCEDURES.

The following is a summary of required submittals. Complete details and schedules are described in the rest of the section.

Environmental Protection Plan, GA

The Contractor shall submit an environmental protection plan within 15 days after receipt of the notice to proceed. Approval of the Contractor’s plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plan shall include, but not be limited to, the following:

a. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas like trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archaeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental protection, to comply with the applicable laws and regulations, and to correct pollution due to accident, natural causes, or failure to follow the procedures of the environmental protection plan.

d. Location of the permitted solid waste disposal facility to be used.

e. Drawings showing locations of any proposed temporary material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

f. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring.

g. Plan showing the proposed activity in each portion of the work area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.

h. Applicable environmental training (both formal and on the job) the Contractor's personnel have received prior to the construction period.

i.

Hazardous Materials and Hazardous Wastes, FIO

Hazardous Materials Inventory Form (Initial and ongoing)
Material Safety Data Sheets (MSDS)
Hazardous Waste Profile Sheets
Hazardous Waste Accumulation Log
Hazardous Waste Manifest

Lead-based Paint, FIO

Test results
Summary of Paint Removed and Remaining

2 PRODUCTS (Not Used)

3 EXECUTION

3.1 WORK AREA LIMITS

The Contractor shall confine all activities to areas defined by the design drawings and specifications. Prior to any construction, the Contractor shall mark the areas that will not be disturbed under this contract. Isolated areas within the general work area, which are to be saved and protected, shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.1 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer or their representative. Temporary movement or relocation of Contractor facilities shall be made only when approved by the Contracting Officer or their representative.

3.2 MANAGEMENT OF HAZARDOUS MATERIALS AND HAZARDOUS WASTE

3.2.1 GENERAL

3.2.1.1 Definitions

a. Hazardous material (HM): A useful product that requires special management because it has hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) that could pose dangers to human health or the environment. A HM becomes a Hazardous Waste when it can no longer be used for its intended purpose.

b. Hazardous waste (HW): A discarded material with properties that could pose dangers to human health or the environment. A HW either exhibits a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) or is specifically listed as a HW by the EPA or by the State.

c. Material Safety Data Sheet (MSDS): A document containing information that manufacturers are required by law to provide on all products they manufacture and sell. The MSDS is useful in evaluating the product to determine if it has hazardous constituents and the type of medical treatment in case of an accident.

3.2.1.2 Hazardous Waste Management Section (HWMS)

The Contractor shall contact the HWMS at (253) 967-4786 with any questions pertaining to the storage, use, and disposal of Hazardous Materials and/or Hazardous Waste during the execution of this contract.

3.2.1.3 Restricted Use Materials

Certain chemicals are restricted from use on Fort Lewis. These chemicals are listed on the Restricted Use List (RUL). The RUL is maintained by the PW Environmental and Natural Resources Division (ENRD) and is updated semi-annually. A print out and/or an electronic copy of the entire RUL is available from ENRD, Building 1210. The Contractor shall receive authorization from the Contracting Officer or their representative prior to using any product that contains chemicals listed on the RUL. Only materials necessary for and associated with the execution of this Contract will be allowed on Government property.

3.2.1.4 Contingency Planning and Spill Response

The Contractor shall comply with the provisions of the Fort Lewis Spill Prevention, Control and Countermeasures Plan (SPCCP) and the Installation Spill Contingency Plan (ISCP). The PW ENRD maintains these plans. The Contractor shall also maintain on site a written contingency plan for HW accumulation and HM storage areas if the work associated with this contract generates HW or require storage of HM.

3.2.1.5 Transportation of HM and HW

The Contractor shall comply with all Department of Transportation (DOT) requirements associated with HM/HW, including proper container marking/labeling and vehicle placarding when transporting HM/HW on or off the installation. The Contractor shall obtain Government approval prior to removal of any HW from the installation. Removal shall only be done by an authorized HW transporter having an EPA Identification Number and with the HW recorded on a Uniform Hazardous Waste Manifest (EPA Form 8700-22).

3.2.1.6 HM/HW Personnel and Training Requirements

The Contractor shall appoint an Environmental Compliance Officer (ECO) and a Hazardous Waste Technician (HWT) in writing, if the work associated with this contract causes the Contractor to generate, store, or handle HM/HW. The ECO/HWT shall be responsible for insuring the requirements of this specification are met.

The Contractor shall ensure that all personnel are trained in accordance with Washington Department of Ecology regulations before being assigned to any position handling HW/HM. This training shall include, but not be limited to:

a. Hazardous Materials Use, Storage and Disposal Training Course for ECOs/HWTs. The 8 hour course is available weekly from the Fort Lewis ENRD Hazardous Waste Management Section (HWMS) and shall be taken prior to the Contractor generating, storing, or handling HM or HW on the installation. The Contractor shall contact the HWMS to schedule attendance.

b. First Responder Awareness Level as specified in the ISCP.

c. Quarterly contingency plan review and rehearsal.

d. Hazard Communication training as stated in paragraph 3.2.2.5.

The Contractor shall maintain a record of all required training, and the date conducted, for each individual requiring training and shall make this record available to the Government at all times during the execution of this contract.

3.2.2 HAZARDOUS MATERIALS

3.2.2.1 Notification

The Contractor shall provide an initial inventory and MSDS copies for all HM to be used during the execution of this contract, to the PW, Engineering & Contract Management Division. The inventory shall include the type of HM, proposed storage location and quantity to be stored and shall be provided before bringing any HM onto the installation. The Contractor shall use the Hazardous Material Inventory form (HFL Form 953-Enclosure No. 1) or a contractor-generated form providing the same information. An electronic version of the Hazardous Material Inventory form is available from the PW ENRD in Building 1210.

3.2.2.2 Storage Facilities

Facilities shall meet all fire code requirements and provide adequate ventilation, containment, and protection from the elements. Provide warning signs, limit access to the facility, and lock it when it is unattended. Only HM shall be stored in the facility. Contractor vehicles are not considered a proper storage facility. No HM shall be stored in vehicles overnight or for any length of time.

3.2.2.3 Storage and Use

The Contractor shall store HM according to product labels and MSDS requirements. Non-compatible materials shall not be stored together. All containers shall be properly labeled as to contents and kept in good condition with tight fitting lids. Unopened containers shall be segregated from opened containers. Personal protective equipment (PPE) required by the MSDS or product label shall be available and worn by all personnel who handle the product.

3.2.2.4 Inspections, Record Keeping and Reporting

The Contractor shall perform weekly inspections of their HM storage facilities utilizing the HM Inspection Checklist (HFL Form 951-Enclosure No. 2). A current inventory of the HM storage facility shall be maintained on site and a copy forwarded to PW, Engineering & Contract Management Division quarterly using the Hazardous Material Inventory form. Additionally, a current MSDS for each product used or stored shall be present and on file at the site where the product is used or stored.

3.2.2.5 Hazard Communication Program

The Contractor shall have a written Hazard Communication program, which explains how personnel are informed and trained concerning HM in the workplace as required by Federal, state and Fort Lewis regulations. The written program shall be located at a hazard communication station that is accessible to all Contractor personnel and shall contain the following sections:

a. A current inventory of HM, who is responsible for classifying a product as a HM, and how the inventory is updated.

b. Labels and other forms of warning: This section shall describe the procedure for insuring that each HM container is clearly labeled and has the appropriate warnings. The section also states who is responsible for labeling requirements and how label information is updated.

c. MSDS file: The location of the MSDS file, who maintains the file, and how personnel may access the file, shall be described. This section shall also describe what is done when a product is received without the MSDS and how the MSDS file is updated.

d. Personnel training and information: This section shall describe initial and refresher training provided to personnel concerning the hazards of the HM in the workplace, the training provided, and who conducts the training.

e. Information to non-Contractor personnel: This section shall describe how non-Contractor personnel are informed about possible hazards, where MSDS copies can be obtained, and what PPE is required in the workplace.

3.2.3 HAZARDOUS WASTE

3.2.3.1 Identification

The Contractor shall identify all HW generated during the execution of this contract. The Contractor shall completely characterize the waste stream to identify the waste constituents. Each waste stream identity shall be recorded on a Hazardous Waste Profile Sheet (HWPS) and submitted to PW, Engineering & Contract Management Division for approval prior to waste generation. Profile sheets are available from the HWMS or Contractor generated equivalent sheets may be used. The Contractor is responsible for any costs associated with laboratory analysis to verify the waste stream identity if it is not obviously evident.

3.2.3.2 Accumulation

HW shall be accumulated in waste-compatible, sturdy, leak-proof, closed containers that are Department of Transportation (DOT) approved. If the waste is to be disposed of on Fort Lewis, the Contractor shall accumulate wastes only in Government issued HW containers. The Contractor shall contact the HWMS, phone (253) 967-4786 for drums at Fort Lewis. At YTC, contact the Directorate of Environmental and Natural Resources, phone (509) 577-3402. At VCB contact the ECO, phone (360) 694-5538.

Each HW container shall be clearly labeled with the words HAZARDOUS WASTE, a description of the waste, and the hazard associated description or label. Any container issued by the HWMS at Fort Lewis shall have a Bar-coded label that contains all necessary labeling information. This label can be obtained by contacting the HWMS.

3.2.3.3 Container Management

HW shall be handled in a manner that prevents leaks, spills, fires, and explosions. Container tops and/or bungs shall be serviceable and tightly installed (wrench tight) at all times except when adding material to the container (material should not spill if the container tips over). Containers shall be properly grounded when transferring flammable materials. Containers holding flammable liquids (flash point less than 140 degrees F) shall be grounded. Reactive and ignitable waste containers shall be stored in a manner compatible with NFPA Fire Code requirements. Incompatible wastes shall not be accumulated in the same container or in the same area.

The container accumulation area shall be 50 feet from any other occupied building, shall have overhead cover, and shall be capable of being secured. Access to the area shall be restricted to trained personnel who need to be in and use the area. The site shall be locked when not in use. The container accumulation area shall have a secondary containment system capable of collecting and holding spills

and leaks. It shall be sized to hold 110% of the volume of the largest container. A minimum of thirty inches of aisle space shall be maintained between container rows. Container markings and labels shall be clearly visible.

3.2.3.4 Inspection, Record Keeping and Reporting

The Contractor shall inspect each accumulation point weekly, utilizing the attached Hazardous Waste Accumulation Areas checklist, (HFL Form 950-Enclosure No. 3) to verify compliance with the above requirements. The checklist shall be available on site for inspection.

3.2.3.5 Transportation and Disposal

The Contractor shall be responsible for the transportation and disposal off site of all HW generated from the execution of this contract, unless stated otherwise in this specification.

The Contractor or his representative, who provides services that generate, prepare for shipment or transports hazardous waste or provides hazardous waste clean-up/disposal services, shall be responsible for preparing EPA Form 8700-22, Uniform Hazardous Waste Manifest, for the state to which the material is being transported. The Contractor shall comply with all manifest and record keeping and reporting requirements. Specific manifesting procedures include:

a. The Uniform Hazardous Waste Manifest will only be signed by personnel in the HWMS at Building 1210 on Fort Lewis.

b. The Contractor shall provide a copy of the Uniform Hazardous Waste Manifest and supporting documentation (i.e., waste profile and land ban as appropriate) no less than 72 hours in advance of the proposed transporter pick up date.

c. The Contractor shall coordinate and schedule transportation pick up dates and times by contacting the HWMS at (253) 967-4786 or 3268. This will ensure qualified individuals are available for the certification/signature of the manifest and other related documentation. A waste profile (land ban when required) must accompany the manifest to verify description of material being transported.

The Contractor shall be responsible for verifying that the shipment is properly identified (profiled), packaged, marked, labeled, and not leaking. The Contractor shall apply appropriate placards to his vehicle while transporting hazardous materials/waste.

The Contractor shall ensure that the transporter and disposal facility have a valid Environmental Protection Agency identification number for the applicable hazardous waste services, i.e., transportation, treatment, storage, or disposal. The Contractor shall ensure that the transporter drivers have current DOT combination licenses. The Contractor shall ensure that the carrier has instructed and

trained personnel concerning the applicable Hazardous Materials Transportation Act (HMTA) regulations relevant to their job functions.

The Contractor or his representatives shall take appropriate action (including cleanup) in the event of a release/spill. If a release/spill occurs on Fort Lewis the Contractor shall immediately notify the Fort Lewis Fire Department (Dial 911). Secondary notification shall be made to (253) 967-4786 or 3268.

The Contractor shall ensure the transporter and disposal facility has liability insurance in effect for claims arising out of death or bodily injury and property damage from hazardous material/waste transport, treatment, storage, and disposal, including vehicle liability and legal defense costs in the amount of $1,000,000.00, as evidenced by a certificate of insurance for General, Automobile, and Environmental Liability Coverage.

3.2.3.6 Hazardous Waste Turn-In

The Contractor shall coordinate turn-in of small quantities of Hazardous Waste. Only HW generated on site as a result of the Contractor's execution of this contract will be accepted. At Fort Lewis, coordination for turn-in shall be made with the HWMS, phone (253) 967-4786. At Yakima Training Center, contact the Directorate of Environmental and Natural Resources, phone (509) 577-3402. At Vancouver Barracks, contact the Environmental Compliance Officer, phone (360) 694-5538.

Containers shall be turned in no later than 90 days after the accumulation start date (earlier if full). All HW that is turned in must be properly identified and characterized, contained, marked/labeled, and (if turned in from a site outside Fort Lewis) manifested. The HWMS will provide assistance to the Contractor at Fort Lewis, YTC, and Vancouver Barracks. This assistance does not free the Contractor from the responsibility of insuring that the waste is identified and managed in accordance with all of the above requirements so that it is acceptable for turn-in. The following procedures shall be followed:

a. Identify the HW. The HW should be one of the waste streams that the activity is permitted to generate and for which a HWPS has been submitted. HM that has become HW shall require the name of the product, the MSDS, the stock number if known, and manufacturer if known, or a completed waste profile analysis.

b. List the type, size, and number of containers, or items (e.g., PCB transformers).

c. Prepare the HW container(s) for turn-in as directed by the HWMS representative. If the container is closed, the HWMS representative may require the Contractor to open the container(s) to verify proper identification of the HW (not applicable to original, factory-sealed containers).

d. Provide certification as to HW identity and container compliance with appropriate regulations. The Contractor's ECO shall sign the certificate.

3.3 POLYCHLORINATED BIPHENYLS (PCB)

3.3.1 Transformers

The Contractor shall notify PW, Engineering & Contract Management Division on the day that any electrical transformer is delivered to Fort Lewis. All transformers brought on to Fort Lewis that are fluid filled must contain less than two parts/million (ppm) PCBs and be accompanied by a letter from the manufacturer that indicates that the level of PCBs in the transformer is below two ppm. Copies of all PCB letters and nameplate information shall be provided to PW, Engineering & Contract Management Division.

3.3.2 Light Ballasts

All light ballasts removed which are marked, as non-PCB must be disposed of in accordance with Fort Lewis waste designations. This designation can be obtained from the HWMS.

3.4 LEAD PAINT – NOT USED

3.5 ASBESTOS – NOT USED

3.6 Radiation Safety

All aspects of the job relating to radiation safety, including transportation, use, storage or handling must be addressed by the Contractor through PW, Engineering & Contract Management Division to the Installation Radiation Safety Officer, Installation Safety Office, Building 6069, Fort Lewis, WA, phone: (253) 967-3079/6764.

3.7 UNDERGROUND STORAGE TANKS (USTs) AND PETROLEUM CONTAMINATED SOIL(PCS) – NOT USED

3.8 DISPOSAL OF SOLID WASTE

3.8.1 General

The Contractor shall be responsible for the disposal off site of all refuse generated in the course of performance of this contract, to include containers, transport, handling, and dumping fees. All solid wastes shall be placed in containers that are emptied on a regular schedule. The Contractor will not be permitted to deposit refuse in existing garbage cans or refuse dumpsters. No burning of refuse is allowed. All vehicle loads of waste being transported shall be adequately secured to prevent spillage.

3.9 PROTECTION OF LAND RESOURCES

Prior to the beginning of any construction, the Contractor shall identify the land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs,

vines, grasses, topsoil, and land forms without special permission from the Contracting Officer or their representative. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized.

3.9.1 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

3.9.2 Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated on the design drawings and specifications. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in cases where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be totally cleared. Clearing of such areas shall progress in reasonably sized increments as needed to use the developed areas as approved by the Contracting Officer or their representative.

3.9.3 Disturbed Areas

The Contractor shall effectively prevent erosion and control sedimentation through approved methods including, but not limited to, the following:

a. Retardation and control of runoff. Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, berms, and by any measures required by area wide plans under the Clean Water Act.
b. Erosion and sedimentation control devices. The Contractor shall construct or install temporary and permanent erosion and sedimentation control features as indicated on the drawings. Berms, dikes, drains, sedimentation basins, grassing, and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.
c. Sediment basins. Sediment from construction areas shall be trapped in temporary or permanent sediment basins in accordance with the drawings.

The basins shall accommodate the runoff of a local 5 year, 24 hour storm. After each storm, the basins shall be pumped dry and accumulated sediment shall be removed to maintain basin effectiveness. Overflow shall be controlled by paved weirs or by vertical overflow pipes. The collected topsoil sediment shall be reused for fill on the construction site, and/or stockpiled for use at another site. The Contractor shall institute effluent quality monitoring programs as required by State and local environmental agencies.

3.9.4 Tree Protection

The Contractor shall exercise care when excavating trenches in the vicinity of trees. Where roots are two inches in diameter or greater, the trench shall be excavated by hand or tunneled. When large roots are exposed, they shall be wrapped with heavy burlap for protection and to prevent drying. Trenches dug by machines adjacent to trees having roots less than two inches in diameter shall have the sides hand trimmed, making a clean cut of the roots. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately protected by moist burlap or canvas.

3.9.5 Trees Removed During Construction

The Contractor shall be responsible for disposal off site of all waste materials generated in the course of the performance of this contract, to include containers, transport, handling, and dumping fees.

3.9.6 Restoration of Landscape Damage

All landscape features (vegetation - such as trees, plants, and grass) damaged or destroyed during Contractor operations outside and within the work areas shall be restored by the Contractor to a condition similar to that which existed prior to construction activities unless otherwise indicated on the drawings or in the specifications. All vegetation that was removed or damaged consisting of native species shall be replaced with native species. If the area had been previously landscaped with non-native species then similar plants shall be used for replacement. Landscaping shall be maintained for a minimum of 60 days after planting, to include irrigation. The Contractor shall coordinate with ENRD prior to planting any non-native species.

Trees shall be replaced in kind with a minimum 4-inch caliper nursery stock, except trees removed for the new headworks construction shall not be replaced. Shrubs, vines, and ground cover shall be replaced in kind; the Contracting Officer or their representative shall approve size. All plant material shall meet specifications outlined in ANSI Z60.1 - current publication, "American Standard for Nursery Stock."

3.10 PROTECTION OF WATER RESOURCES

3.10.1 General

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation when such application may cause contamination of the fresh water reserve. Monitoring of water areas affected by construction shall be the Contractor's responsibility. The Contractor shall monitor all water areas affected by construction activities. The Contractor shall observe all prescribed setbacks from streams and wetlands as specified in FL REG 200-1.

3.10.2 Washing and Curing Water

Stormwaters from sites less than 5 acres, directly derived from construction activities shall not be allowed to enter water areas. Stormwaters shall be collected and placed in retention ponds where suspended material can be settled out or the water evaporates to separate pollutants from the water. Analysis shall

be performed and results reviewed and approved before water in retention ponds is discharged.

3.10.3 Cofferdam and Diversion Operations – Not Used

3.10.4 Stream Crossings – Not Used

3.10.5 Fish and Wildlife

The Contractor shall minimize interference with, disturbance to, and damage of fish and wildlife. The Contractor prior to beginning of construction operations shall list species that require specific attention along with measures for their protection.

3.10.6 Wellhead Protection Areas

Particular care shall be taken to prevent the introduction of any contaminant to the surface in a designated Wellhead Protection Area (WPA). Certain activities that may pose a danger to groundwater resources are prohibited within WPAs.

3.10.7 Construction Stormwater Permit

The National Pollutant Discharge Elimination System (NPDES), requires general permits, a notice of intent, and a notice of discontinuation for construction sites greater than 5 acres discharging stormwater to any waters of the United States. The Contractor shall file a Notice of Intent with the EPA for coverage under the EPA's general permit for storm water discharges from construction activities. A copy of the NOI shall be submitted to PW, Engineering & Contract Management Division. The Contractor shall be responsible for compliance with the terms of the permit, including the development of a storm water pollution prevention plan.

3.11 PROTECTION OF AIR RESOURCES

3.11.1 General

Dust particles, aerosols, and gaseous byproducts from construction activities, processing, and preparation of materials shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and state allowable limits at all times. The Contractor shall not conceal or mask the emission of an air pollutant which violates air pollution regulations or causes a detriment to the health, safety, or welfare of any person.

An air pollution source shall not emit air pollutants in such quantities and of such characteristics and duration which are likely to be injurious to human health, plant or animal life, property, or which unreasonably interfere with enjoyment of life and property.

3.11.2 Fugitive Dust

Fugitive dust created as a result of construction activities shall be controlled with the BACT such as spraying with water. Contractor vehicles shall not enter public roadways with deposits of mud, dirt, or other debris or unsecured loads. Fugitive dust shall not be emitted from air pollution generating equipment such as boilers and incinerators.

3.11.3 Painting Operations

Spray painting shall not be conducted except inside a paint booth, which utilizes a dry filter system and is approved by ENRD for use. This requirement does not apply to the use of hand-held aerosol cans, coating of buildings and similar type structures, and painting of other items which ENRD deems can not be sprayed in a paint booth.

3.11.4 Burning Natural Vegetation

All cantonment areas, housing areas and all of North Fort are designated as no burn areas. A burning permit is required for burning natural vegetation in all other areas on Fort Lewis. Burning permits may be obtained from the PW Forestry Section. A copy of the permit shall be submitted to PW, Engineering & Contract Management Division.

3.11.5 Notice of Construction Permits

The Contractor shall be responsible for obtaining any necessary Puget Sound Clean Air Agency "Notice of Construction" permits for the construction/installation of new air emission sources provided under this project. The Contractor is responsible for the associated fees.

The following process shall be followed when filing a Notice of Construction and Application for Approval. The Contractor shall complete the application including the Environmental Checklist (the proper forms can be obtained from the Puget Sound Clean Air Agency (PSCAA)). The Contractor shall then submit the application and a cashier's check addressed to PSCAA for the associated plan examination fee to PW, Contract & Engineering Management Division. The application and check are to be submitted in a sealed envelope clearly marked with PSCAA Notice of Construction Application and Associated Fee. The Government will review the application. If it is complete and accurate, the Application will be submitted by the Government to PSCAA with the check. If it is not complete or accurate, the Contractor will be requested to submit a revised Application. The Contractor shall allow 30 days for review and submission by the Government. After submission, the Contractor shall allow 75 days for review, negotiation, and approval by PSAPCA. This process time line applies to standard projects. If the project is a major air pollution source, which requires other environmental documentation and public comment, the process time should be adjusted accordingly.

The Contractor is responsible for assuring all the standards/limits included in the Order of Approval to the Notice of Construction and Application for Approval are implemented or met. This includes developing an Operations and Maintenance plan to assure compliance with all environmental requirements and any testing of the air pollution source, the control equipment, or the monitoring equipment required by the Order of Approval or other regulatory requirement (this may be a supplement to any O&M manuals required elsewhere in the technical specifications).

The address on the Notice of Construction and Application for Approval for the property owner as well as the applicant should be PUBLIC WORKS, ATTN: AFZH-PWE, MS 17E, BOX 339500, FORT LEWIS, WA, 98433-9500.

3.11.6 Best Available Control Technology (BACT)

The Contractor shall utilize the BACT as determined by the regulatory authority on all air pollution sources. The Contracting Officer or their representative shall be notified for resolution if this requires a change in the design.

3.12 PRESERVATION OF HISTORICAL, CULTURAL, AND ARCHEOLOGICAL RESOURCES

If, during construction activities, the Contractor observes items that might have historical or archeological significance, the Contractor shall immediately contact the Contracting Officer or their representative and shall cease all activities that may result in the destruction of these resources and shall prevent its employees from trespassing on, removing, or otherwise damaging such resources.

3.13 PROTECTION OF FISH AND WILDLIFE

The Contractor shall conduct their operations in a manner that will minimize impacts on surrounding fish and wildlife. If, during construction activities, the Contractor observes any Federal or State protected species, the Contractor shall immediately contact the Contracting Officer or their representative and cease all activities at the site.

UNIT/ACTIVITY: _____ BUILDING NUMBER: _____

DATE: _____

HAZARDOUS WASTE ACCUMULATION AREA CHECKLIST

	GO	NO GO	COMMENTS
1. Are all HW containers within a Fort Lewis approved HW accumulation facility or meet facility requirements listed in Appendix G, FL Reg 200-1?	____	____	_____
2. Are only Fort Lewis or subinstallation issued HW containers used?	____	____	_____
3. Do containers have the Fort Lewis or subinstallation issued bar code label, or meet HW labeling requirements?	____	____	_____
4. Are containers positioned so labels can be easily read?	____	____	_____
5. Are containers free from leaks, excessive rust, damage, or excessive spillage/residue on the outside of the container? Are leaks into secondary containment cleaned up?	____	____	_____
6. Has any HW container exceeded its turn-in date?	____	____	_____
7. Are container lids (bungs) properly installed and (wrench) tight to prevent leakage if the container is overturned?	____	____	_____
8. When stored together, do incompatibles, flammables, corrosives, or oxidizers have physical barriers to prevent mixing?	____	____	_____
9. Are drums containing flammables properly grounded?	____	____	_____
10. Is there a minimum thirty-inch separation between aisles of containers, and are rows of drums no more than two wide?	____	____	_____
11. Is the HW segregated from new material?	____	____	_____
12. Is there a functioning emergency alarm at the facility?	____	____	_____
13. Have HM storage areas been inspected to verify there are no spills, damaged or leaking containers, expired shelf life items, or unsafe storage?	____	____	_____

INSPECTOR: _____ **SIGNATURE:** _____
__

UNIT/ACTIVITY: _____ BUILDING NUMBER: _____

DATE: _____

HAZARDOUS MATERIAL INSPECTION CHECKLIST

This checklist will be used for inspecting facilities where hazardous materials (HM) are stored. These locations include supply rooms, motor pools, paint lockers, field sanitation boxes, NBC rooms, communication sections, warehouses, laboratories, shops, or any other sites where HM are stored.

	GO	NO GO	COMMENTS
1. Are HM stored in a Fort Lewis approved facility or meet facility requirements in Appendix F, FL Reg 200-1?	____	____	_____
2. Are incompatible materials segregated, e.g., corrosives and oxidizers segregated from flammable products and stored on ground level? (See storage incompatibility charts in Appendix F, FL Reg 200-1)	____	____	_____
3. Are flammables stored away from sources of heat, ignition, flames, or sparks?	____	____	_____
4. Are inventories of HM recorded and updated as required by AR 710-2?	____	____	_____
5. Are MSDSs available on-site for all HM stored?	____	____	_____
6. Is a spill plan posted, and is a fully stocked spill kit readily available?	____	____	_____
7. Are product containers serviceable? (Not leaking, no dents or excessive rust, and lid(s) tightly closed)	____	____	_____
8. Are container labels legible and clearly identify the name of the material in the container?	____	____	_____
9. Are containers within shelf life expiration dates?	____	____	_____
10. Are new products segregated from "in-use" containers, and are stocks rotated on a "first opened, first used" basis?	____	____	_____

11. Is the paint locker stored inside a heated building?	____	____	_____
12. Are containers stored in an orderly manner, and is the HM storage area free of clutter and debris?	____	____	_____
13. Are gas cylinders properly identified, leak-tight, secured or racked, and stored away from sources of heat, flames, or sparks?	____	____	_____
14. Do opened, "in-use" containers have secondary containment?	____	____	_____

INSPECTOR: _____ **SIGNATURE:** _____

END OF SECTION

SECTION 02531

REPAIR SANITARY SEWERS
(OPTION ITEM #0006)

1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM C 14	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 33	(1999) Concrete Aggregates
ASTM C 76	(2000) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 94	(2000) Ready-Mixed Concrete
ASTM C 150	(1999) Portland Cement
ASTM C 270	(2000) Mortar for Unit Masonry
ASTM C 443	(1998) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 828	(1998, R 1996) Low-Pressure Air Test of Vitrified Clay Pipe Lines
ASTM C 924	(1998) Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
ASTM C 972	(2000) Compression-Recovery of Tape Sealant
ASTM D 412	(1998) Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers – Tension
ASTM D 624	(2000) Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

ASTM D 638	Test Methods for Tensile Properties of Plastics
ASTM D 790	Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 1248	Specification for Polyethylene Plastic Molding and Extrusion Materials
ASTM D 1784	(1999) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 2751	(1996) Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D 4101	Specifications for Prolylene Plastic Injection and Extrusion Materials
ASTM F 402	(1993; R 1999) Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings
ASTM F 477	(1999) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 949	(2000) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F 1216	Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

1.2 GENERAL REQUIREMENTS

The construction required herein shall include appurtenant structures and building sewers to points of connection with the building drains 5 feet outside the building to which the sewer system is to be connected. The Contractor shall replace damaged material and redo unacceptable work at no additional cost to the Government. Excavation and backfilling is specified in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Backfilling shall be accomplished after inspection by the Contracting Officer. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install the plastic pipe shall be stored in accordance with the manufacturer's recommendation and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTALS:

SD-9 Statements

Method of Repair (FIO)

Provide a statement indicating the method of repair (replacement or cured in place pipe) selected for the existing sanitary sewer to be repaired. Method of pipe connection to existing and new manholes and structures.

Dewatering Plan (FIO)

Method of dewatering including equipment sizes and contingency plan should dewatering cause settlement of adjacent facilities. The plan shall show specific locations, in plan and section, where dewatering is expected, as well as general discussion of methods should water be encountered in other locations.

Bypass Pumping Plan (FIO)

Method and plan for the bypass pumping of existing sewer flows. The plan shall indicate how the Contractor will insure there are no overflows of untreated sewage.

Satisfactory Installation (FIO)

A statement signed by the principal officer of the contracting firm stating that the installation is satisfactory and in accordance with the contract drawings and Specifications and the manufacturers prescribed procedures and techniques upon completion of the project and before final acceptance.

SD-13 Certificates

Portland Cement; FIO.

Certificates of compliance stating the type of cement used in manufacture of concrete pipe, fittings and precast manholes.

Installation (FIO)

A statement signed by the manufacturer’s field representative certifying the Contractor’s personnel are capable of installing the pipe on the project.

2 PRODUCTS

2.1 PIPE

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Concrete Pipe

Concrete pipe greater than 24 inches in diameter shall be reinforced and conform to ASTM C 76, Class IV. Pipe 36 inches or greater in diameter shall be bell and spigot type, tongue and groove type, or modified tongue and groove type.

2.1.2 PVC Pipe

24 inch and greater PVC shall be class C905 or PVC closed profile gravity sewer pipe. Class C905 PVC shall meet the requirements of UBPPA UNI-B-11. All PR165 pipe shall meet the requirements of DR25. PVC shall be certified by the compounder as meeting the requirements of ASTM D 1784, cell Class 12454B. The pipe stiffness shall be greater than or equal to 735/D for cohesionless material pipe trench backfills. PVC profile sewer pipe shall meet the requirements of ASTM 794, cell class 12364A, with a minimum stiffness of 46 psi, meeting ASTM D2412.

2.1.3 Cured-in-Place Pipe Lining

Cured in place pipe lining shall be designed, manufactured and installed in accordance with ASTM F 1216. The cured in place pipe lining shall be designed to meet the following external loading conditions:

Depth of cover:	Maximum cover for each run between
Traffic Loading:	H-20 plus impact
Excavation widths:	Pipe OD plus 3’
Soil weight:	130 pcf
E’ value:	700

For design purposes, the Contractor shall assume the groundwater table is one foot from the existing ground surface. The Contractor shall provide sealers and repairs to withstand this pressure.

The material when cured shall be continuous and formed to the original pipe, reconstructing the pipe’s strength without allowance for the existing concrete pipe.

The tube shall be fabricated to a size that, when installed, will neatly fit the internal circumference of the existing pipe.

Physical strength after curing shall conform to the following standards:

Cured Strength	**Standard**	**Minimum**
Tensile Stress	ASTM D638	3,000 PSI
Flexural Strength	ASTM D790	4,500 PSI
Flexural Modulus of Elasticity	ASTM D790	300,000 PSI

The contractor shall provide certification from the manufacturer that the pipe liner material conforms with the requirements of this Specification and specific installation requirements, including all steps of the heating and cooling phase listing pressure requirements, and length of time for each step in the processing.

2.2 REQUIREMENTS FOR FITTINGS

Fittings shall be compatible with the pipe supplied and shall have a strength not less than that of the pipe. Fittings shall conform to the respective specifications and other requirements specified below.

2.2.1 Fittings for Concrete Pipe

ASTM C 76 for pipe greater than 24 inches in diameter.

2.2.2 2.2.2 Fittings for Plastic Pipe

PVC composite sewer pipe fittings shall conform to ASTM D 2680.

2.2.2.1 Fittings for PVC Pipe

ASTM D 3034 for type PSM pipe.

2.3 JOINTS

Joints installation shall comply with the manufacturer's instructions.

2.3.1 Concrete Pipe Jointing

Joints and gaskets shall conform to ASTM C 443.

2.3.2 Plastic Pipe Jointing

Flexible plastic pipe (PVC or high density polyethylene pipe) gasketed joints shall conform to ASTM D 3212.

2.4 FLEXIBLE COUPLINGS

Flexible Couplings used for connection of pipe shall be as follows:

PVC to CONCRETE:	Romac Style RC 400 or TC 400, or equal. Flexible coupling shall be fusion bonded epoxy coated w/stainless steel bolts and nuts.

2.5 BRANCH CONNECTIONS

Branch connections shall be made by use of regular fittings or solvent cemented saddles as approved. Saddles for PVC composite pipe shall conform to Figure 2 of ASTM D 2680 and Table 4 of ASTM D 3034.

2.6 FRAMES AND COVERS

Frames and covers shall be cast iron, ductile iron or reinforced concrete. Cast iron frames and covers shall be as indicated or shall be of type suitable for the application, circular, without vent holes. The frames and covers shall have a combined weight of not less than 400 pounds. Reinforced concrete frames and covers shall be as indicated or shall conform to

ASTM C 478 or ASTM C 478M. The word "Sewer" shall be stamped or cast into covers so that it is plainly visible.

2.7 MANHOLE STEPS/LADDER

2.7.1 POLYPROPYLENE MANHOLE STEPS

Polypropylene manhole steps shall be made of a copolymer polypropylene superior in its resistance, and meeting the requirements of ASTM 2146 Type II, Grade 16909, and shall completely encapsulate a deformed 1.2 inch steel reinforcing rod conforming to ASTM A615, Grade 60. Polypropylene steps shall be factory installed in complete accordance with the manufacturer's instructions.

2.7.2 STEEL LADDER

A steel ladder shall be provided where the depth of a manhole exceeds 12 feet. The ladder shall not be less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123.

2.8 MANHOLE MARKER POSTS

A manhole marker post shall be located adjacent to all manholes located outside the roadway corridor, or as directed by Fort Lewis Public Works. The marker post shall be green in color, 3.75 inches wide (flat), 60 inches long and furnished with a 3-inch by 3-inch high intensity white reflector (250 candle power) and a flexible anchor barb. The marker posts shall be set so as to leave 36 inches of the post exposed above grade.

2.9 CEMENT MORTAR

Cement mortar shall conform to ASTM C 270, Type M with Type II cement.

2.9.1 Portland Cement

Portland cement shall conform to ASTM C 150, Type II for concrete used in concrete pipe, concrete pipe fittings, and manholes and type optional with the Contractor for cement used in concrete cradle, concrete encasement, and thrust blocking.

2.9.2 Portland Cement Concrete

Portland cement concrete shall conform to ASTM C 94, compressive strength of 4000 psi at 28 days, except for concrete cradle and encasement or concrete blocks for manholes. Concrete used for cradle and encasement shall have a compressive strength of 2500 psi minimum at 28 days. Concrete in place shall be protected from freezing and moisture loss for 7 days.

2.10 STRUCTURES

2.10.1 Precast Reinforced Concrete Manhole Sections

Precast reinforced concrete manhole sections shall conform to ASTM C 478, except that Portland cement shall be as specified herein. Joints shall be cement mortar, an approved mastic, rubber gaskets, a combination of these types; or the use of external preformed rubber joint seals and extruded rolls of rubber with mastic adhesive on one side.

3 EXECUTION

3.1 GENERAL

The Contractor shall assume the ground water is one foot below the ground surface. The Contractor shall provide sealers and repairs to withstand this pressure.

3.2 DEWATERING

During excavation, installation of conduit and structures, and the placing of backfill, excavations shall be kept free of water. The Contractor shall furnish all equipment necessary to dewater the excavation and shall dispose of the water in such a manner as not to cause a nuisance or menace to the public. The dewatering system shall be installed and operated by the contractor so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soil, prevent disturbance of backfill and prevent movement of structures and pipelines.

Dewatering shall be done by such method as the Contractor may elect. Dewatering sufficient to maintain the groundwater level at or below the surface of trench bottom, base of the bedding course or other foundation shall be accomplished prior to pipe laying and jointing or placement of reinforcing steel for concrete. The dewatering operation, however accomplished, shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the excavation. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked or provided with other means to prevent pumping of fine sands or silts from the subsurface. A continual check by the Contractor shall be maintained to insure that the subsurface soil is not being removed by the dewatering operation. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop.

Should settlement be observed, the Contractor shall cease dewatering operations and implement contingency plans as outlined in the approved dewatering plan. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor. Permanent piping systems existing or new shall not be incorporated into the Contractor's dewatering system.

Depending on the groundwater inflow and the depth of excavation below the groundwater table, dewatering may require the installation of sumps, wells or well points. In general, if the

proposed excavation is to be more than 2 or 3 feet below the water table, sumps may not suffice, and dewatering may have to be accomplished using wells.

3.3 EXISTING SEWER FLOWS

The contractor shall provide for the diversion of sewer flows during construction. The Contractor shall take all steps necessary to ensure that the existing facilities or temporary facilities remain fully operational during all stages of construction. Overflows of untreated sewage will not be permitted. The Contractor shall be responsible for making all arrangements and scheduling for temporary sewage handling. This shall include all connections of temporary pumping equipment with temporary electrical service with controls.

The bypass pumping shall be designed to handle the existing sewer flows.

3.4 INSTALLATION

3.4.1 Adjacent Facilities

3.4.1.1 Water Lines

Where the location of the sewer is not clearly defined by dimensions on the drawings, the sewer shall not be closer horizontally than 10 feet to a water-supply main or service line, except that where the bottom of the water pipe will be at least 12 inches above the top of the sewer pipe, the horizontal spacing may be a minimum of 6 feet. Where gravity-flow sewers cross above water lines, the sewer pipe for a distance of 10 feet on each side of the crossing shall be fully encased in concrete or shall be acceptable pressure pipe with no joint closer horizontally than 3 feet to the crossing. The thickness of the concrete encasement including that at the pipe joints shall be not less than 4 inches.

3.4.1.2 Structural Foundations

Where sewer pipe is to be installed within 3 feet of an existing or proposed building or structural foundation or any similar structure, the sewer pipe shall be sleeved as specified above. Contractor shall ensure there is no damage to these structures, and no settlement or movement of foundations or footing.

3.4.2 Pipe Laying

a. Pipe shall be protected during handling against impact shocks and free fall; the pipe interior shall be free of extraneous material.

b. Pipe laying shall proceed upgrade with the spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow. Each pipe shall be laid accurately to the line and grade shown on the drawings. Pipe shall be laid and centered so that the sewer has a uniform invert. As the work progresses, the interior of the sewer shall be cleared of all superfluous materials.

c. Before making pipe joints, all surfaces of the portions of the pipe to be joined shall be clean and dry. Lubricants, primers, and adhesives shall be used as recommended

by the pipe manufacturer. The joints shall then be placed, fitted, joined, and adjusted to obtain the degree of water tightness required.

d. ABS composite pipe ends with exposed truss and filler material shall be coated with solvent weld material before making the joint to prevent water or air passage at the joint between the inner and outer wall of the pipe.

e. Installations of solvent weld joint pipe, using ABS or PVC pipe and fittings shall be in accordance with ASTM F 402. The Contractor shall ensure adequate trench ventilation and protection for workers installing the pipe.

3.4.2.1 Caulked Joints

The packing material shall be well packed into the annular space to prevent the entrance of lead into the pipe. The remainder of the space shall be filled with molten lead that is hot enough to show a rapid change in color when stirred. Scum shall be removed before pouring. The lead shall be caulked to form a tight joint without overstraining the bell and shall have a minimum depth of 1 inch after caulking.

3.4.2.2 Trenches

Trenches shall be kept free of water and as dry as possible during bedding, laying, and jointing and for as long a period as required. When work is not in progress, open ends of pipe and fittings shall be satisfactorily closed so that no trench water or other material will enter the pipe or fittings.

3.4.2.3 Backfill

As soon as possible after the joint is made, sufficient backfill material shall be placed along the pipe to prevent pipe movement off line or grade. Plastic pipe shall be completely covered to prevent damage from ultraviolet light.

3.4.2.4 Width of Trench

If the maximum width of the trench at the top of the pipe, as specified in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS, is exceeded for any reason other than by direction, the Contractor shall install, at no additional cost to the Government, concrete cradling, pipe encasement, or other bedding required to support the added load of the backfill.

3.4.2.5 Jointing

Joints between different pipe materials shall be made as specified, using approved jointing materials.

3.4.2.6 Handling and Storage

Pipe, fittings and joint material shall be handled and stored in accordance with the manufacturer's recommendations. Storage facilities for plastic pipe, fittings, joint materials

and solvents shall be classified and marked in accordance with NFPA 704, with classification as indicated in NFPA 49 and NFPA 325-1.

3.4.3 Leakage Tests

Lines shall be tested for leakage by low pressure air testing, infiltration tests or exfiltration tests, as appropriate. Low pressure air testing for PVC pipe shall be as prescribed in UBPPA UNI-B-6. Low pressure air testing procedures for other pipe materials shall use the pressures and testing times prescribed in ASTM C 828 and ASTM C 924, after consultation with the pipe manufacturer. Prior to infiltration or exfiltration tests, the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. When the Contracting Officer determines that infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re-established. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 0.2 gal per inch diameter per 100 feet of pipeline per hour. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be made at no additional cost to the Government.

Final air testing shall not be accepted until after the finished paving is accomplished, all other underground utilities have been installed and the lines have been flushed, cleaned, deflection tested and television inspected.

3.4.4 Test for Deflection

When flexible pipe is used, a deflection test shall be made on the entire length of the installed pipeline not less than 30 days after the completion of all work including the leakage test, backfill, and placement of any fill, grading, paving, concrete, or superimposed loads. Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. The ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 92.5 percent of the inside diameter of the pipe. A tolerance of plus 0.5 percent will be permitted. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface brinell hardness of not less than 150. The device shall be center bored and through bolted with a 1/4 inch minimum diameter steel shaft having a yield strength of 70,000 psi or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer; a pull exerted on the opposite end of the shaft shall produce compression throughout the remote end of the ball, cylinder or circular section. Circular sections shall be spaced so that the distance from the external faces of the front and back sections shall equal or exceed the diameter of the circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through or by being

flushed through with water, shall be cause for rejection of that run. When a deflection device is used for the test in lieu of the ball, cylinder, or circular sections described, such device shall be approved prior to use. The device shall be sensitive to 1.0 percent of the diameter of the pipe being measured and shall be accurate to 1.0 percent of the indicated dimension. Installed pipe showing deflections greater than 7.5 percent of the normal diameter of the pipe, shall be retested by a run from the opposite direction. If the retest also fails, the suspect pipe shall be replaced at no cost to the Government.

3.5 CURED IN PLACE PIPE (CIPP) INSTALLATION

3.5.1 CLEANING EXISTING PIPELINE

The Contractor shall clear and clean the line for the portion of work to be completed under the contract by flushing the line with water at pressure and volumes required to remove the existing materials prior to initiating work. The existing concrete pipe and manholes shall be pressure cleaned to remove all loose materials so as not to prohibit CIPP lining operations.

The Contractor shall insert a screen in the downstream manhole to catch the material for removal. The water can flow downstream in the existing sewer system.

All solids removed shall be disposed of in an environmentally safe manner and in accordance with State Department of Health Regulations. The Contractor shall submit to the Contracting Officer an outline of its methods, equipment and supplies proposed for leaning the pipe.

3.5.2 PRECONSTRUCTION TELEVISION INSPECTION

All pipelines shall be inspected using closed circuit television equipment (CCTV). Television inspections will be performed after all other test requirements have been achieved. The Contracting Officer or Contracting Officer's representative shall be present during the television inspection. Inspections will be conducted at times agreed upon by the Contracting Officer and the Contractor and will be scheduled to coordinate with the project progress schedule.

If television inspections reveal areas where the construction is unsatisfactory, the Contractor shall, at his/her own expense, repair or replace all defective materials or workmanship. No repair shall be made until the repair method has been submitted to and approved by the Engineer. The results of the television inspections on those portions of the project so inspected shall be satisfactory to the Contracting Officer before the final acceptance of the project.

If the Contracting Officer requests a television inspection and the inspection reveals construction deficiencies which must be corrected, the cost of reinspection by television will be at no cost to the Government.

Television inspection for pipelines 8-inches and larger, shall be preformed with a color CCTV tilt head camera recorded in standard VHS format. Television inspection for pipelines smaller than 8-inches shall be preformed with a color push head CCTV camera recorded in standard VHS format.

3.5.3 CURED IN PLACE PIPE LINING FOR ~~24 AND~~ 36-INCH PIPE

The contractor shall line the existing sanitary sewer pipe by furnishing and installing a tailored-thermostat impregnated flexible felt material, which is introduced into an existing pipeline by use of a hydrostatic head. The materials are cured by circulating hot water within the tube. When cured, the finished pipe shall be continuous and formed tot he original pipe, reconstructing the pipe's strength without allowance for the existing deteriorated pipe.

3.5.4 EXISTING SERVICES

If the cured-in-place pipe is to traverse any existing service connections, the conduit entrance shall be opened out to the required dimensions. Service connections are to be reinstated internally with the use of a remote-controlled cutting device or man-entry techniques.

3.5.5 CURED IN PLACE PIPE CONNECTION TO EXISTING MANHOLES

If the cured in place replacement pipe is to traverse any existing manhole, the conduit entrance and exits to the existing manhole shall be opened out to the required dimensions and modifications shall be made to the invert before installation to maintain a smooth transition through the manhole.

3.6 POST-INSTALLATION CLEANING AND INSPECTION

Prior to final inspection, all pipelines shall be tested, flushed and cleaned, and all debris removed. A pipeline "cleaning ball" of the proper diameter for each size of pipe shall be flushed through all pipelines prior to final inspection.

Before sewer lines are accepted, the Contractor shall conduct a closed circuit television inspection, utilizing video equipment with pan and tilt capabilities, of the sewer pipe and appurtenances in the presence of the Contracting Officer, and provide two copies of the VHS videotapes tot he Contracting Officer.

3.7 MANHOLE DETAILS

3.7.1 General Requirements

Manholes shall be constructed of concrete, or precast concrete manhole sections. The invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly. The invert channels shall be formed directly in the concrete of the manhole base, or shall be built up with brick and mortar, or shall be half tile laid in concrete, or shall be constructed by laying full section sewer pipe through the manhole and breaking out the top half after the surrounding concrete has hardened. Pipe connections shall be made to manhole using water stops, standard O-ring joints, special manhole coupling, or shall be made in accordance with the manufacturer's recommendation. The Contractor's proposed method of connection, list of materials selected, and specials required, shall be approved prior to installation. The floor of the manhole outside the channels shall be smooth and shall slope toward the channels not less than 1 inch per foot nor more than 2 inches per foot. Free drop inside the manholes shall not exceed 18 inches, measured from the invert of

the inlet pipe to the top of the floor of the manhole outside the channels; drop manholes shall be constructed whenever the free drop would otherwise be greater than 1 foot 6 inches.

3.7.2 Anchorage

Ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet apart vertically, and shall be installed to provide at least 6 inches of space between the wall and the rungs. The wall along the line of the ladder shall be vertical for its entire length.

3.7.3 Jointing, Plastering and Sealing

Mortar joints shall be completely filled and shall be smooth and free from surplus mortar on the inside of the manhole. Mortar and mastic joints between precast rings shall be full-bedded in jointing compound and shall be smoothed to a uniform surface on both the interior and exterior of the manhole. Installation of rubber gasket joints between precast rings shall be in accordance with the recommendations of the manufacturer. Precast rings may also be sealed by the use of extruded rolls of rubber with mastic adhesive on one side.

3.7.4 Setting of Frames and Covers

Unless otherwise indicated, tops of frames and covers shall be set flush with finished grade in paved areas or 2 inches higher than finished grade in unpaved areas. Frame and cover assemblies shall be sealed to manhole sections using external preformed rubber joint seals that meet the requirements of ASTM D 412 and ASTM D 624, or other methods specified in paragraph Jointing, Plastering and Sealing, unless otherwise specified.

3.7.5 External Preformed Rubber Joint Seals

External preformed rubber joint seals and extruded rolls of rubber with mastic adhesive shall meet the requirements of ASTM D 412 and ASTM C 972 to ensure conformance with paragraph Leakage Tests. The seal shall be multi-section with neoprene rubber top section and all lower sections made of Ethylene Propylene Di Monomer (EPDM) rubber with a minimum thickness of 60 mils. Each unit shall consist of a top and a bottom section and shall have mastic on the bottom of the bottom section and mastic on the top and bottom of the top section. The mastic shall be non-hardening butyl rubber sealant and shall seal to the cone/top slab of the manhole/catch basin and over the lip of the casting. One unit shall seal a casting and up to six, 2 inch adjusting rings. The bottom section shall be 12 inches in height. A 6 inch high top section will cover up to two, 2 inch adjusting rings. A 12 inch high bottom section will cover up to six, 2 inch adjusting rings. Extension sections shall cover up to two more adjusting rings. Each extension shall overlap the bottom section by 2 inches and shall be overlapped by the top section by 2 inches.

3.8 CONNECTING TO EXISTING MANHOLES

Pipe connections to existing manholes shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the

pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

3.9 CLEANOUTS AND OTHER APPURTENANCES

Cleanouts and other appurtenances shall be installed where shown on the drawings or as directed by the Contracting Officer, and shall conform to the detail of the drawings.

3.10 TESTING OF MANHOLES

3.10.1 Vacuum Test

3.10.1.1 The Contractor shall be fully familiar with the vacuum testing equipment that he proposes to use. The vacuum test shall be performed prior to backfilling the manhole. All lift holes shall be plugged and pipe openings plugged and braced to prevent plugs from being drawn into the manhole.

3.10.1.2 Testing of all manholes shall be in accordance the following:

a. Initial pressure test - 10 inches Hg (i.e. 20 inches Hg absolute)

b. Test time - A vacuum of 10 inches of Hg shall be drawn and the vacuum pump shut off. With the valve closed, the time shall be measured for the vacuum to drop to 9 inches. The manholes shall pass if the time is greater than that shown below.

Depth	Time (seconds)					
	48" Dia.	54" Dia.	60" Dia.	72" Dia.	120" Dia.	144" Dia.
0-10	60	70	80	90	110	120
10-15	90	100	110	120	140	150
15-25	120	130	140	150	170	180

3.10.1.3 If pressure drop exceeds 1" Hg in 2 minutes, the unit shall be repaired and retested.

3.10.1.4 If a unit fails to meet a 1" Hg drop in 1 minute after repair, the unit shall be water exfiltration tested and repaired as necessary.

3.10.1.5 Joint repairs by parging are to be done on both outside and inside of joint to ensure a permanent seal. Vacuum testing draws together the joint and applies high pressure to the elastomeric joint material. Properly placed and sized elastomeric joint material must be used to avoid leakage or to enable sections to be separated if necessary to effect a repair.

3.10.2 Repairs to manholes required to meet leakage requirements shall be accomplished using knife IGAS mastic, or joint sealant (chemical grouting) applied from outside the manhole or by other methods proposed by the Contractor and approved by the Contracting Officer.

3.11 ABANDON EXISTING MANHOLES

Where it is required that an existing structure be abandoned, the structure shall be broken down to a depth of at least 4 feet below the surface elevation, all connections plugged, and the manhole filled with sand and compact to 95% density. Debris resulting from breaking the upper part of the manhole may be mixed with the sand subject to approval of the Contracting Officer.

END OF SECTION

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SECTION 11325

GRIT CROSS COLLECTORS

1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1 (1998) Motors and Generators

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

Product Data

Equipment; G

A complete list of equipment and material, including manufacturer's descriptive data and technical literature, performance charts and curves, catalog cuts, wiring diagrams, and installation instructions.

Operation and Maintenance

Operation and Maintenance Instructions; G

See Section 01710 for requirements.

1.3 SCOPE

There shall be furnished and installed two (2) gear driven screw cross collectors as shown on the Plans and specified herein.

The equipment shall include drive units, drive shaft, screw conveyor, bearing assemblies, grease and oil lines, gear box, anchor bolts, and all other appurtenances required for a complete and operable installation as shown on the Plans, or specified herein.

1.4 EQUIPMENT LIST

Equipment numbers are as follows:

Item	Equipment Number
Grit Cross Collector No. 1	01 GCC 01
Grit Cross Collector No. 2	01 GCC 02

1.5 DELIVERY AND STORAGE

All equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The grit cross collector equipment specified in this section shall be as manufactured by WesTech Engineering, Inc. or Eimco Process Equipment Company or U.S. Filter/Envirex, or equal.

2.2 DRIVE UNIT

The drive unit shall be manufactured by the grit cross collector equipment supplier to ensure unit responsibility. The drive unit shall consist of a helical speed reducer ~~unit~~ and motor coupled to the vertical gear reducer as described in paragraph 2.3 SPEED REDUCING UNIT. ~~The hollow shaft speed reducer shall be directly coupled to the motor and mounted directly on the drive shaft.~~ The drive shall rotate the conveyor at the specified speed and shall be designed for 24-hour a day operation under normal moderate shock loadings. ~~The drive bearings shall be designed for the total rotating weigh with a minimum L-10 life for continuous operation of 50 years or 450,000 hours.~~

~~All gearing shall be designed per the latest edition of the AGMA standards for strength and durability, based on a life of 175,000 hours at the design running torque rating of the drive unit.~~

2.3 SPEED REDUCING UNIT

The speed reducing unit shall consist of helical speed reducers directly connected to the motor through the use of a flexible coupling ~~and shall be keyed to the pinion~~. Belt drives are not acceptable.

Speed reducer helical gearing shall be manufactured to AGMA standards and bear an AGMA nameplate. The speed reducer shall have a service factor of 1.25. The speed reducer shall be mounted vertically with the output shaft pointing down with sealing for this arrangement.

The reducers shall be fitted with radial and thrust bearings of proper size for all mechanism loads and be grease lubricated.

2.4 MOTOR

The motor shall be a standard, TEFC, electric induction motor meeting NEMA MG-1 and other applicable NEMA, ANSI IEEE standards. Motor shall be constructed with Class B or F insulated windings, B 30,000 anti-friction bearings, cast iron frame and end bells. The motor nameplate rating shall be 3 HP (minimum), 460 volts AC, 3 phase, 60 HZ, 1800 RPM, continuous duty at 40°C ambient air temperature with a 1.15~~2.0~~ service factor.

Motor shall be labeled and listed by a recognized electrical testing laboratory for the application, or approved by the Washington State Department of Labor and Industries for installation on the project.

2.5 DRIVE SHAFT

The drive shaft shall be a minimum of 2 15/16" diameter solid one piece 4150 steel keyed on both ends. The upper end of the drive shaft shall be connected to the speed reducer with a shear pin coupling complete with trip device for limit switch trip device.

There shall be an intermediate support bearing provided to support the drive shaft. This bear shall be mounted on the vertical wall of grit chamber and be mounted on a fabricated stainless steel support. The support bearing shall be a bronze bushed pillow block, split type with 304 stainless steel fasteners. On each side of the support bearing, there will be C.I. safety collars with 2 – 3/8" bronze thrust washers mounted between the safety collars and the bearing.

The lower end of the drive shall will be connected to the right angle box through a flexible coupling designed for the application.

All hardware shall be 304 SST>

2.6 RIGHT ANGLE BOX

The underwater gear box shall be a spiral bevel gear reducer with a 1:1 ratio designed for submerged application completed with double stainless steel seals, stainless steel shafts, epoxy coated and completely filled with grease. As a minimum requirement, the right angle gear box shall be rated at 2 times the running torque of the main drive gear box.

The right angle gear box shall be connect to the drive shaft of the horizontal screw through a specially designed flexible coupling for submerged service.

2.7 SCREW CONVEYOR

A screw conveyor shall be installed in a concrete trough at the bottom of the grit basin. The screw conveyor shall convey settled grit from the main and secondary chambers to the hopper at the drive end of the screw conveyor. Clearance between the screw and trough shall be sufficient to allow a build up of sand or grit that will provide a bed for the screw. Grit will be conveyed on this bed to eliminate tank wear.

The grit screw shall consist of a 12" diameter half pitch screw conveyor with 3/8" thick sectional steel flights. Leading edge of the flights shall be hard faced to retard wear. The flights shall be continuously welded on a pipe of sufficient diameter to limit deflection due to bending to no more than 1/4" between bearings. The pipe shall be at least 3-1/2" diameter. The end shaft shall be bolted to the screw pipe and shall incorporate a "Quik-Link" connection to facilitate mounting the screw in the concrete tank.

2.8 BEARINGS

The submerged bearing shall be enclosed in a cast iron housing. The bearing assembly shall also include a mechanical seal and will be designed to prevent the entry of grit. The bearing assembly shall consist of two (2) ball bearings, each with a calculated L_{10} life of 20 years under a load equal to half the screw weight. The bearings shall be grease lubricated with feed and return tubing that will allow lubrication while the unit is in service. The tubing shall be 316 stainless steel, of sufficient length and mounted in the tank as shown on the Plans to allow lubrication from the basin walkway.

Water lubricated peak cap self aligning type end wall bearings, specifically designed to prevent the accumulation of settled solids on their surfaces are also acceptable. Bearings shall be two-piece to permit easy removal of the screw shaft without removing the bearing bracket from the wall. Bearings shall incorporated heat-treated ductile iron bearing and keyed bushing mounted in a cast steel bracket. Bearings shall be drilled and tapped for water lubrication supply lines. Hanger bearings shall be hard iron, water lubricated, and shall be mounted in fabricated steel housings.

2.9 METALLIC COLLARS

All collars furnished for shafting shall be manufactured of cast iron. The collars shall be of split construction mounted with 3/8" diameter stainless steel hardware. The collars shall have male-female locators to assure proper alignment.

2.10 HARDWARE

All hardware and anchor bolts shall be 316 SS.

2.11 NAMEPLATES

Motors and drives shall have a nameplate affixed to the unit in a conspicuous place. All nameplates shall be of stainless steel suitably attached to the motor. Nameplates shall contain the manufacturer's name, motor size and type, serial number, speed, and other pertinent data.

2.12 PAINTING

The new drive unit may be shop coated or painted in accordance with Section 09900, non-submerged metal, severe conditions.

3 EXECUTION

3.1 GENERAL

The grit cross collectors shall be installed as shown on the Plans and in accordance with the manufacturer's recommendations.

3.2 MANUFACTURER'S REPRESENTATIVE

A representative of the grit cross collector manufacturer shall be provided to inspect the installation, make any field adjustments necessary to ensure proper operation, and instruct the Owner's personnel on proper operation and maintenance. Manufacturer's services shall include 2 days at the site (two visits) and shall be included in the lump sum bid price.

END OF SECTION